

**Applicant:** Kanunari Hanano  
**Application No.:** 10/657,978

**REMARKS/ARGUMENTS**

The present application contains Claims 1 through 54. Claims 4-6, 8-12, 16-18, 23, 24, 28-30, 32-36, 40-42, 47 and 48 have been withdrawn from consideration as being directed to a non-elected specie. Claims 1-3, 7, 13-15, 19-22, 25-27, 31, 37-39, 43-46, 49 and 50 have been examined on the merits. Claims 1, 7, 14, 21, 25, 31, 38, 45, 49 and 50 have been amended. The specification has been amended to cure certain minor informalities. Now new matter has been added

It is noted that the present action is a non-final and is responsive to the communication filed with the Patent Office on August 2, 2005.

It is noted that the drawings filed September 9, 2003 have been accepted and it is further noted that the claim for foreign priority has been acknowledged and that all other certified copies of the priority documents have been received.

Claims 7, 14, 21, 31, 38 and 45 have been objected to. These claims have been amended and submitted that this objection should be withdrawn. Regarding claim 7 and 31 NA has been changed to "numerical aperture", NA being the standard abbreviation therefor. Note, for example, Websters Third International Dictionary, a copy of the Copyright Notice page, and page 1550 and a copy of the definition from Wikipedia accompanying this amendment.

Claims 1-3, 7, 13-15, 19, 21, 22, 25-27, 31, 37-39, 43, 46, 49 and 50 have been rejected under 35 U.S.C. § 102(b) as anticipated by Tiao et al. (Patent '669). This rejection is respectfully traversed.

The examiner makes reference to figure 7A and 8A of Patent '669.

Making reference to figure 7A of Patent '669, the incident surface and the outgoing surface are both curved. Note especially figure 7B showing one integrator 722 in detail. Light emitted from LED 712 is refracted at the curved convex incident surface converges away from the long sides and toward the central axis and is emitted from the outgoing curved convex surface without being reflected on the side surface of integrator 720. Note especially the light rays in two of the integrators in figure 7A and in the integrator 722 in figure 7B. It should be noted that there is no internal reflection along the side surfaces of the integrators 720.

In contrast, the "columnar light leading member" recited in claim 1 of the present application and shown, for example, in any one of the elected species of figures 9A through 11 are configured to guide light to the outgoing radiation end surface by reflecting at least a part of the light rays collected from the incident end surface, on the reflection surface. Thus, the structure, effect and advantages of the present invention are all different from those of figure 7A of Patent '669.

Figures 8A and 8B show "wedge glass rod array 820" which admittedly correspond to the "columnar light leading member" set forth in claim 1 of the present

application. However, in patent "669 the outgoing radiation end surface of the "wedged glass road array 820" and the surface of the "light valve 850" have a conjugate relationship. The structure of figure 8A is typically known as a "critical illumination" type structure.

More particularly, the invention of the present application has an arrangement in which the outgoing radiation end surface of the "columnar light leading member" and the surface of the "irradiation area" (i.e. light modulation element 12) **do not** have a conjugate relationship. For example, noting figure 5 of the present application it can be seen that the distance from the outgoing radiation end surface of the "columnar light leading member" to the "illumination lens 11" and the distance from the "illumination lens" to the "light modulation element 12" are substantially equal to a focal distance  $f$  and do not have a conjugate relationship. The arrangement of figure 8A utilizes a lens array 830 made of individual lens 832 and a converging lens 840. It is clear from the arrangement of figure 8A that the distance between the output irradiation surface of the tapered members 822 and lens 840 and a distance between lens 840 and the light valve 850 is not equal and is not a focal distance  $f$ .

Claim 1 as amended recites the afore-mentioned relationship. Claims 2, 3, 7, 13, 15, 19, 21 and 22 all depend from claim 1 and carry all of its limitations and patentably distinguish over Patent "669.

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New claim 51 depends on claim 1 and recites that said distance is a focal length distance  $f$ . New claim 52 recites that the incident end surface and the outgoing radiation end surface are planar surfaces. Note especially the elected embodiments of figure 11 of the present application.

Claim 25 has been amended to recite limitations substantially similar to the limitations in claim 1, as amended. Claims 26, 27, 31, 37-39, 43 and 46 all depend from claim 25 and patentably distinguish over Patent "669.

Claims 49 and 50 have been amended to recite limitations similar to claims 1 and 25 and it is submitted that these claims patentably distinguish over Patent "669.

Claims 1, 13-15, 19-22, 25, 37-39, 43-46, 49 and 50 have been rejected under 35 U.S.C. §102(b) as anticipated by Parker (Patent '216). This rejection is respectfully traversed.

Parker is limited to teaching light pipes 38 provided between light sources 32 and optical integrator 40, and an optical path lens 42. Patent '216 fails to teach an angle position converting member configured to convert an outgoing light angle intensity of the outgoing light from the outgoing radiation end surface of the columnar light leading member into a position intensity in a predetermined irradiation area. Claims 13-15 and 19-22 all depend from claim 1 and it is submitted that all of these claims patentably distinguish over Patent '216.

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Claim 25, as amended recites the angle position converting member substantially as recited in claim 1. Claims 37-39 and 43-46 depend from claim 25 and it is submitted that all of these claims patentably distinguish over Patent '216.

Claims 49 and 50 likewise recite angle position converting means substantially as recited in claims 1 and 25 and it is submitted that all of these claims patentably distinguish over Patent '216.

In view of the foregoing, it is submitted that claims 1-3, 7, 13-15, 19-22, 25-27, 31, 37-39, 43-46, 49 and 50 are now allowable and reconsideration and allowance of these claims are respectfully solicited and that new claims 51-52, which depend from claim 1, and claims 53-54, which depend from claim 25, are allowable and consideration and allowance of these are likewise respectfully solicited.

The Examiner is invited to contact the undersigned on behalf of the applicant to resolve any issues which may require further resolution with a view to expediting the prosecution.


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In view of the foregoing amendments and remarks, Applicants respectfully submit that the present application, including claims 1-3, 7, 13-15, 19-22, 25-27, 31, 37-39, 43-46 and 49-54, is in condition for allowance and a notice to that effect is respectfully requested.

Favorable action is awaited.

Respectfully submitted,

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LW/tmf  
Enclosures

# Numerical aperture

From Wikipedia, the free encyclopedia.

In optics, the **numerical aperture (NA)** of an optical system is a dimensionless number that characterizes the range of angles over which the system can accept or emit light. The exact definition of the term varies slightly between different areas of optics.

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- 1 General optics
- 2 Laser physics
- 3 Fiber optics
  - 3.1 Sources
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## General optics

In most areas of optics, and especially in microscopy, the numerical aperture of an optical system such as an objective lens is defined by

$$\text{NA} = n \sin \theta$$

where  $n$  is the index of refraction of the medium in which the lens is working (1.0 for air, 1.33 for pure water, and up to 1.56 for oils), and  $\theta$  is the half-angle of the maximum cone of light that can enter or exit the lens. In general, this is the angle of the real marginal ray in the system. The angular aperture of the lens is twice this value. The NA is generally measured with respect to a particular object or image point and will vary as that point is moved.

In microscopy, NA is important because it indicates the resolving power of a lens. The size of the finest detail that can be resolved is proportional to  $\lambda/\text{NA}$ , where  $\lambda$  is the wavelength of the light. A lens with a larger numerical aperture will be able to visualize finer details than a lens with a smaller numerical aperture. Lenses with larger numerical apertures also collect more light and will generally provide a brighter image.

Numerical aperture is a measure of the diameter of the aperture compared to the focal length. In photography, this relationship is usually expressed via the f-number,  $f/\#$ , which for a thin lens imaging an object at infinity is given by

$$f/\# = \frac{1}{2 \text{NA}}.$$

## Laser physics

In laser physics, the numerical aperture is defined slightly differently. Laser beams spread out as they propagate, but slowly. Far away from the narrowest part of the beam, the spread is roughly linear with distance—the laser beam forms a cone of light in the "far field". The same relation gives the NA,

$$\text{NA} = n \sin \theta,$$

# Webster's Third New International Dictionary

OF THE ENGLISH LANGUAGE  
UNABRIDGED

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REG. U. S. PAT. OFF.

*Utilizing all the experience and resources of more than  
one hundred years of Merriam-Webster dictionaries*

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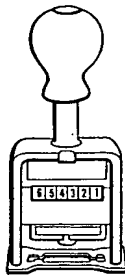
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SPRINGFIELD, MASSACHUSETTS, U.S.A.



shortly withdrew -J.C.Archer) b: an as-  
the possibility of numbering (the sands of the  
nd ~ times without ~) c: an allotted total  
the whole ~ of Senators -U.S.Constitution  
its of a particular kind (an enormous ~ of  
Carroll) (there is a limited ~ of such labora-  
-H.W.H.King) (archery clubs have ~) d: a  
nd their ~ is growing rapidly -Amer. Guide  
an unspecified total: SEVERAL (a ~ of solu-  
posed -S.H.Hofstadter) (the ~ concern  
brick buildings -Amer. Guide Series: N.H.)  
he has exhibited a ~ of times -Mary  
quite a few (a ~ of instances) 2 a: a select  
to be in that ~ when the saints go marching  
into Go Marching In b obs (1) a: a designated  
to (a mineral) (the ~ of bitumens -A.  
specified group of people (this happy ~ at  
specified days and nights with us -Shak.)  
s group: MULTITUDE; specif: PROLETARIAT  
hanged, but not be crowned -Alexander  
numerative aspect of things existing in counta-  
k sense of time and ~ -G.T.Trevartha  
4 a: an abstract unit in a numerical series  
~ (a ~ divisible by two) b: numbers pl  
putation: ARITHMETIC (teach children their  
le ~s to the calculus -Brit. Book News)  
l of word form to denote reference to one or  
ne or in some languages also to two usu-  
l inflectional change; also: the distinctive  
noun, adjective, or verb) of the group  
stinguished ~ compare PLURAL, SINGULAR  
ful change: RHYTHM (in full harmonic ~  
fition) (2) numbers pl, archaic: musical  
holy ~s which thou warblest -W.M.Praed)  
(3) symmetry of cadence: PERIOD (melodic ~s  
itors) (2) metrical structure: METEER (most  
oet's song -Alexander Pope) (3) metrical  
ese ~s with I fear, and write in prose -Shak.)  
or group, or group of symbols representing  
~s under three digits -Kate L. Turab-  
ERAL (the code employs letters as well as ~s)  
label or designation; as (1) a: a digit or group  
a means of identification (house ~) (cata-  
d a ~ on each ball -Millen Brand) (2) specif:  
(the victim remembered the ~ of the getaway  
ence (take ~ two position in column -Wirt-  
l: relative position on a promotion roster (for  
his ship ~ he was reduced ten ~s -Allan  
an individual identified by position in a  
a numerical label (opened fire on the three  
English Talk) (tackled on the line of scrim-  
to (the keeper ~ was just a new ~, another  
issue -Gilbert Millstein) ~ compare OPPOSITE  
the specified position of an article in a series  
established criteria (as of size or quality) (~  
ne manila) (a ~ two can of tomatoes) ~ com-  
(5) a: a telephone number (dialed a ~) b: a  
hone -Hamilton Basso) (6) of the numerical  
s the result of a chemical test and used in char-  
ubstance tested (the iodine ~ of a fatty oil)  
apply: QUANTITY, SWARM (squaretails in ~  
rook) ~ usu. used in pl. (~s of this shark  
k shoals of sardines -J.L.B.Smith) (indi-  
so -Persuasion) (~ of beauties major and  
avis) 8 numbers pl a: a numerous group  
d on the way -Marjory S. Douglas) b: a  
nderance (there is safety in ~s) c: units of  
ir ~s outstrip their resources -Barbara Ward)  
chool doubled its ~s -C.F.Smith) 9 a: a  
l periodical (a year's subscription brings you  
icle will appear in the February ~) b: one  
ut from a group; as (1) a: one of a company of  
n (two ~ stokers as ammunition ~s -The  
: GIRL (a cute ~ in a yellow dress -R.L.  
idined ~) draped in silver fox -Margaret  
usual, theatrical, or literary selection or produc-  
ittle ~ in waltz time -A.E.Stevens) b: a  
ps half ~ that dozes ~ that dozes among the best  
rote -Robert Collet) (novel ~ was going to  
ne of those amnesia ~s -E.J.Fitzgerald) (sup-  
ery little ~ for just fifteen performances  
r) (the tango ~ late in Act I -Theatre Arts)  
l merchandise offered for sale (put that black  
the sequins on the blonde dummy -Ben-  
nylon ~ which he calls an ~ vest -New  
a lot of money to bring out any new toy ~  
ys) (a more modestly priced blanket is an al-  
lilton Basso) 10: information about or insight  
ability or character (the other side had his ~  
him -Mary Deasy) (she was incapable of sub-  
n't take him long to get her ~) 11 numbers  
in constr a: a form of letter play (in U.S.  
ay select any three digits from 001 to 999 and  
appear in a specified order or in any combina-  
ich the winning numbers and order are deter-  
es regularly published in newspapers (as clear-  
ck market receipts, pari-mutuel payoffs, or the  
icle on contract bridge) ~ called also number  
racy b: POLICY 2a  
NUMERAL, NUMERAL, FIGURE, DIGIT, and INTEGER can  
n a character by which an arithmetical value is  
MBER may refer to a character or to a word (the  
ive) (the number 45) or to a character with  
ordinal numbers 2d, 3d, and 4th) NUMERAL  
characters as numbers as distinguished from  
ing for the same license plates (the 1991  
rs and the numerals 13249) (the Roman numer-  
KLII) FIGURE stresses the characters as charac-  
ic (write the numbers in figures wherever possi-  
ce) (his salary went into five figures) DIGIT  
to one of the characters in Arabic notation (if  
Arabic numerals consist of 10 digits, though  
es exclude as a digit) ~ in Arabic, in an arith-  
arithmetical term for a whole number, one that is  
t contain a fraction (11½ is not an integer) SYN  
SUM  
ER: quite a few (laid out with any number of  
nt species -B.C.Cronwright) ~ by the num-  
n union to a specific count or cadence 2: in a  
time, or mechanical manner (a program run out  
but with concern for the present ~ have  
on it: to be destined by fate to cause the death  
used of a projectile (as a bullet)  
v numbered; numbered; numbering -b(a)r-  
[ME numbrēn, numbrēn, fr. OF numbrer, fr. L  
numerus number] vt 1 a: to ascertain the number  
~ his friends by the hundreds) b: archaic: to  
to mathematical processes: compare CALCULATE  
ing the interval of time from one ~ festival to  
mas Taylor) c: obs: to gauge the amount of  
ets cannot think, speak, cast, write, sing, ~  
k) 2: to claim as part of a total: INCLUDE (it  
ident that I am ~ed among American philoso-  
ges Santayana) (writers resident in Texas ~ed  
who ~ a literary work was not included in the  
Texas) (prudence with the cardinal  
Taylor) 3: to restrict to a limited or definite  
ors told him his days were ~ed -H.E.Starr)  
number to stay as a means of identification (~  
book) (esp. on ~ed highways) (we use letters to  
f seats in an assembly room -D.E.Smith) (five  
ars of the stolen money was in red bills -E.S.

Massinger) c: APPORTION, DIVIDE (days of this life's pil-  
grimage ... to ~ wisely -J.W.Warner) (my ~ fellows I ~ed  
into two companies -William Morris) 6 archaic: to ex-  
perience the passage of (an interval of time) (I since then have  
~ed o'er some thrice three years -Alfred, Lord Tennyson) esp: to  
reach or have (a specified age) in years (of as able-bodied men)  
~ (the ~ they may ~) (Shak.) 7: to comprise in number  
TOTAL (they were ~ miscellaneous lot ~ in all some 20  
or 30 -R.W.Southern) (his extensive collection ... ~ing  
many thousand specimens -Wittmer Stone) ~ vt 1: to reach  
a total: COUNT (controls ~ literally in the thousands  
-Harold Koontz & Cyril O'Donnell) 2: to call off numbers  
in sequence (sing, song, sam, she ~ed in Stamese -Kathryn  
Grondahl); esp: to call off one's number as a member of a  
square or group (men fall in in single rank and ~ from the right  
four ~s -Fire Service Drill Bk.) ~ often used with off  
lined up and ~ed off) SYN see COUNT  
number -n(ə)m(ə)r(ə) / comparative of NUMB  
num-ber-able 'namb(ə)rəbəl / adj: capable of being num-  
bered  
number agreement n: grammatical concord in form (as  
singular, dual, or plural) of adjective with noun, finite verb  
subject, object, or pronoun with antecedent  
number-board 'n(ə)m(ə)r(ə)b(ə)rd / n: SLATE 3b  
number eight iron n: PITCHING NIBBLICK  
num-ber-er 'n(ə)b(ə)r(ə)' / n-s: one that numbers  
number field or number system n: the aggregate of all num-  
bers of a given type (as integers, irrationals, complex numbers,  
vectors) which can be combined by addition or multiplication  
to obtain a result of the same type  
number five iron n: MASHIE  
number four iron n: MASHIE IRON  
numbering machine n: a device for the rapid stamping on  
printing of us. consecutive numbers on  
successive pages, sheets, or discrete items  
num-ber-less 'n(ə)b(ə)r(ə)l(ə)s / adj: too many to  
be counted: INNUMERABLE (the possible  
combinations ~ -Alfred Marshall)  
number nine iron n: NIBBLICK  
number one n: one's own interests or  
welfare: ONESELF (he's very careful of  
number one) (never neglects a chance to  
exploit a personal advantage on the theory  
that you've got to look out for number one)  
number one and a half n: first in rank, im-  
portance, or influence: FOREMOST (Amer-  
ica's number one woman golfer -Provi-  
dence (R.I.) Evening Bulb) (declared  
stamp collecting to be 'the nation's number  
one hobby' -H.M.Ellis) (public enemy  
number one) 2: a: highest or of high  
quality (A 2 (a real number one dinner)  
number one iron n: DRIVING IRON 2  
number plate n: a plate or tab bearing an  
identifying number; specif: LICENSE PLATE  
number pool n: NUMBER 11  
numbers pl of NUMBER, pres 3d sing of  
NUMBER  
number seven iron n: PITCHER 4  
numbers game also numbers pool or numbers racket n  
: NUMBER 11  
number sign n: a sign # (as in #2 pencil and apartment #32)  
used before a numeral to denote number  
number six iron n: MASHIE NIBBLICK  
number theory n: the study  
of the properties of integers  
number two iron n: MIDIRON  
numbest superlative of NUMB  
numbfish 'n(ə)m(ə)b(ə)ʃ / n [numb + fish; fr. the numbing effect of its  
shocks]: ELECTRIC RAY  
numbing adj [fr. pres. part. of numb]: causing numbness  
: DEADENING, STUPIFYING (a deep ~ hurt way down inside me  
-Billings) (the significance of the title ... is explained  
at length -Wolcott Gibbs) ~ numbingly adv  
num-ble also num-bles 'n(ə)m(ə)b(ə)l / n pl [ME numbles,  
nombles, fr. MF nombles, pl. of nouble muscle from the thigh  
of a deer, foin of beef, pork loin, modif. of L lumbulus small  
loin, fr. lumbus loin + -ulus -ule - more at LOIN] certain  
edible viscera (as the heart, liver) of an animal (as a  
deer) (the ~ of the pig) GIBLET 1  
numbly adv: in a numb manner: INSENSIBLY, DULLY (his ...  
arms hung down ~ -Peter Schmid) (the men ... stared up at him  
~ -Irwin Shaw)  
numbness n -es ['n(ə)m(ə)b(ə) + -ness] 1: reduced sensibility to  
touch (patients subsequently experienced a feeling of numbness  
in the thighs -Four. Amer. Med. Assoc.) 2: reduced sensi-  
tivity to perception or emotion: STUPOR (a drowsy ~ pains my  
sense, as though of hemlock I had drunk -John Keats)  
(slipped from her waking ~ into complete oblivion -Mary  
Webb)  
numbrous adj [MF numbreux, fr. nombre number + -eux -ous  
- more at ADJECTIVE] obs: NUMEROUS  
numbs pres 3d sing of NUMB  
numbuckl 'n(ə)m(ə)b(ə)k(ə)l / n: a small deer  
num-dah 'n(ə)m(ə)d(ə) / or nam-mad or na-mad 'n(ə)m(ə)d(ə) / n-s  
[Hindi namdā, fr. Per namad, fr. MPer namat; akin to Av  
namata-brushwood] a thick felted rug of India and Persia  
usu. made of pounded goat's hair and embroidered with bird  
or floral designs in colored wool yarn ~ compare rug  
num-nod 'n(ə)m(ə)n(ə)d(ə) / n: a nod, a nodding  
sudden push, L nuere to nod, Gk nuein to nod, nyssin,  
nytein to prick, sting, Skt navate, nauti he moves, turns)  
1 a: a spirit believed by animists to inhabit a natural object or  
phenomenon (said to have set up one of the stones ... and to  
have poured oil on the top of it as an offering to the deity)  
~ -E.O.James) b: a presiding spirit: a local deity (the ~ that  
watches water and ward over the whole household -J.B.  
Nes) 2: a dynamic or creative force: GENIUS (the strange  
and powerful ~ which, he felt, used him as his tabernacle  
-Aldous Huxley)  
nu-mi-ni-us 'n(ə)m(ə)n(ə)j(ə)' / n, cap [NL, fr. LGK numēnōs, a  
bird, per, the curlew, fr. Gk numēnia, neōmēnia new moon,  
first of the month, fr. ne- + mēnēn month + -ia - more at MOON]  
: a genus of birds (family Scolopacidae) consisting of the  
dunlin  
nu-mer-a-ble 'n(ə)m(ə)r(ə)əb(ə)l / adj [L numerabilis, fr.  
numerate to count + -abilis -able - more at NUMBER]: capable  
of being counted (the small ~ band of runaway planets  
-A.N.Whitehead)  
nu-mer-al 'n(ə)m(ə)r(ə)əl / adj [MF, fr. LL numeralis, fr. L  
numerus number + -ialis -al - more at ADJECTIVE] 1: of relat-  
ing to numbers (numbers ~ adjective) (used the letters of  
the alphabet for ~ symbols -D.E.Smith) 2: consisting of  
numbers or numerals (~ cipher) ~ nu-mer-al-ly 'r(ə)l(ə), -li-  
adv  
numeral 'n(ə)m(ə)r(ə)əl / n-s 1: NUMBER 6 2 numerals pl: the numbers  
designating by year a school or college class (carried a banner  
~ with the class ~s on it in the reunion parade) (won 1st in  
basketball, baseball, and track) ~ compare LETTER 6 SYN see  
nu-mer-a-tion 'n(ə)m(ə)r(ə)ə't(ə)ʃ / vt -ED -ING- / s [L numeratus, past  
part. of numerare to count]: to give a detailed list of: ENU-  
MERATE (might have been illuminating had he ~erated the  
mistakes made by each side -Mary K. Hammond)  
nu-mer-a-tion 'n(ə)m(ə)r(ə)ə't(ə)ʃ / n-s [ME numeracion, fr. L  
numeracion, numeratio, fr. numeratus (past part. of numerare  
to count)]: 1 a: a system or process of  
enumeration (the positional system which came at length by  
way of the Arabs to supersede the clumsy ~ of the Romans  
-Times Lit. Supp.) b: the application of enumerative pro-  
cesses: COMPUTATION (study of African or American Indian  
languages shows systems of ~, often on a decimal scale -D.J.  
Struik) c: an act or instance of counting or of applying num-  
bers to something: REVERE NUMERING (make an exact ~ of



numbering machine

nu-mer-a-tive 'n(ə)m(ə)r(ə)əd-iv, -mə'rād- / adj [numerate +  
-ive] archaic: of or relating to number or numeration (a ~  
noun interposed between it and the substantive -R.K.Doug-  
las)  
numeration 'n(ə)m(ə)r(ə)əd- / n: CLASSIFIER 2  
nu-mer-a-tor 'n(ə)m(ə)r(ə)əd-ə(r), -ə't(ə)r / n-s [F numérateur, fr.  
LL numerator one that counts, fr. L numeratus (past part.  
of numerare to count) + -or] 1: the part of a fraction that is  
above the line and signifies the number of parts of the denomi-  
nator taken: DIVIDEND 2 [LL]: one that numbers  
nu-mer-ic 'n(ə)m(ə)r(ə)ik / adj [L numerus number + E -ic]  
: NUMERICAL (1) esp: denoting a number or a system of num-  
bers (code) (a ~ sign)  
nu-mer-ic-al 'r(ə)k(ə), -r(ə)k / adj [L numerus number + E -ical]  
1 a: of or relating to numbers (~ analyst) (~ superiority of  
the enemy) b: denoting a number (letters of the alphabet  
were employed as ~ signs -William Chomsky) c: expressed  
in figures rather than letters (Spies ~ used a very simple  
cipher, which changed every day -Alexander D'Agapevity)  
(the proportions of hybrid crosses -Lancelot Hoben) (~  
equation) d: designated by number (conscious of his ~ stand-  
ing in every class -Harry Levin) e: of or relating to ability  
to think in or work with numbers (~ skill) (the ~ factor of a  
test) ~ compare VERBAL 2 a archaic: of a corresponding type  
: INDISTINGUISHABLE, SAME (many of these ~ postures ... are  
found in statues of the ancients -John Bulwer) b obs:  
IDENTICAL (in a river we swim in the same place, though not  
in the same ~ water -Robert Burton) (probably that very ~  
book ~ kept in the temple -Thomas Fuller)  
numerical aperture n: a quantity that indicates the resolving  
power of a microscope objective and that is numerically equal  
to the product of the index of refraction of the medium in front  
of the objective and the sine of the angle which the most  
oblique ray entering it makes with the optical axis  
nu-mer-ic-al-ly 'r(ə)k(ə), -r(ə)k / adv 1 a: in respect to  
number: in numbers (a ~ inferior but intellectually potent  
group -K.S.Davis) b: according to number (copy ... is  
filed ~ -E.M.Robinson) c: in figures (if a date is written ~  
-Marjorie E. Skillin & R.M.Gay) 2: in a precisely similar  
way: INDISTINGUISHABLE (the emotion ... is not ~ identical  
-John Dewey)  
numerical rating system n: a system of establishing insurance  
premium rates for standard lives on the basis of numerical  
weights for various impairments  
numerical value n 1 a: a quantitative value assigned to a  
letter of the alphabet (exegetical rule ... according to which  
every Hebrew letter has a numerical value -S.A.Binlon)  
b: a sum obtained by adding together the numerical equiv-  
alents of the letters in a word or phrase (if two names have the  
same numerical value, this fact showed some connection be-  
tween the individuals -D.E.Smith) ~ compare GEMATRIA 2: AB-  
SOLUTE VALUE  
nu-mer-ist 'n(ə)m(ə)r(ə)st / n-s [L numerus number + E -ist]  
archaic: NUMEROLOGIST  
nu-mer-o-log-i-cal 'n(ə)m(ə)r(ə)l(ə)j(ə)k(ə)l / adj: of or relating to  
numerology  
nu-mer-o-log-ist 'n(ə)m(ə)r(ə)l(ə)j(ə)st / n-s: a specialist in  
numerology (bets \$2000 on a horse, after consulting his  
private ~ -Malcolm Cowley)  
nu-mer-o-log-y 'j(ə), -j(ə) / n -es [L numerus number + E -o- +  
-logy]: the study of the occult significance of numbers ~ com-  
pare GEMATRIA  
nu-mer-ous-ly 'n(ə)m(ə)r(ə)əs(ə)l(ə) / adv [MF numerosité  
numerosness, fr. LL numerosus, numerositas, fr. L numeros  
numeros + -itatis, -itas -ity] 1: NUMEROUSNESS (the  
earliest scales of measurement were scales of ~ -S.S.Stevens)  
2 archaic: melodic flow: RHYTHM  
nu-mer-ous 'n(ə)m(ə)r(ə)əs / adj [MF numeros, fr. L num-  
erosus, fr. numerus number + -osus -ous - more at NIMBLE]  
1 a: consisting of great numbers of units: existing in abun-  
dant: MANY, PLENTIFUL (decked out with ... ribbons and  
a thousand other joyous trifles -Osbert Sitwell) (mutation  
... has occurred ~ times under natural conditions -Theod-  
osius Dobzhansky) (legends regarding buried treasure ... are  
as ~ as they are improbable -Thomas Barbour) b: a  
ing of a great number of individuals: LARGE, MULTITUDINOUS  
(it was too bad that the family was ~: each man got only one  
share ~ instead of two -Ernest Beaglehole) (this species has  
become infinitely more ~ during the past five or six years  
-Thomas Heintz) c archaic: of or relating to a great number  
of individuals (the birds begun at four o'clock ... a music  
-Emily Dickinson) 2 archaic: musically cadenced: ~ RHY-  
THMICAL (bank verse ... falling occasionally almost into ~ prose  
-Henry Hallam)  
nu-mer-ous-ly adv: in large numbers: ABUNDANTLY (letters  
have been arriving ~ of late -Virgil Thomson)  
nu-mer-ous-ness n -es: the quality or state of being numerous  
nu-me-rus-clau-sus 'n(ə)m(ə)r(ə)əs(ə)k(ə)l(ə)s(ə) / n [NL, lit., closed or  
restricted number] a quantity (less than the maximal number or  
percentage (as of applicants of a particular race or class) ad-  
missible to an academic institution  
nu-mi-da 'n(ə)m(ə)j(ə)d(ə) / n, cap [NL, fr. L Numida Numidian,  
fr. Gk Nomada] the type genus of Numididae comprising the  
domesticated guinea fowls and closely related African wild  
guinea fowls  
nu-mid-i-an 'n(ə)m(ə)j(ə)d(ə) / adj, usu cap [L Numidianus,  
fr. Numidia + -ianus -ian- of or relating to Numidia, an  
ancient country of No. Africa nearly coextensive with modern  
Algeria]  
numidian 'n(ə)m(ə)j(ə)d(ə) / n-s cap 1: a native or inhabitant of ancient  
Numidia 2: the Berber language of the Numidian people  
numidian alphabet n, usu cap N: LIBYAN ALPHABET  
numidian crane n, usu cap N: DEMOSILE 2a  
nu-mid-i-dae 'n(ə)m(ə)j(ə)d(ə) / n pl, cap [NL, fr. Numida, type  
genus + -idae] a family of African and Madagascan birds  
that are closely related to the pheasants and peacocks and  
often included with them in the family Phasianidae and that  
comprise the guinea fowls ~ see NUMIDA  
numina pl of NUMEN  
nu-mi-nous 'n(ə)m(ə)n(ə)əs / adj [L numin, numen numen + E  
-ous -more at NUMEN] 1 a: of, relating to, or characteristic of  
a numen: SUPERNATURAL (a single dark and ~ power ruling  
the world -Aldous Huxley) b: dedicated to or hallowed by  
association with a deity: SACRED (a ~ wood) c: having  
talismatic properties: MAGICAL (all quests are concerned with  
some ~ object, the waters of life, the Grail, buried treasure  
-W.H.Auden) 2 a: filled with a sense of the presence of  
divinity: HOLY (the holiest, most ~ moment in the Mormon  
moment of transubstantiation -V.C.Aldrich) b: inspiring  
reverence (as beautiful and as ~ as a cathedral -C.E.Raven)  
3 a: appealing to the higher emotions or to the aesthetic sense  
: SPIRITUAL (when tradition has lost its ... ~ authority  
-George Santayana) (the candle was a graceful ... and ~  
method of illumination -New Yorker) b: beyond understand-  
ing or description: MYSTERIOUS, INCOMPREHENSIBLE (empha-  
sizes the ~ aspect of writing -Times Lit. Supp.)  
numinous 'n(ə)m(ə)n(ə)əs / n-s [G numinos, fr. L numin, numen numen]  
an unseen but majestic presence that inspires both dread and  
fascination and constitutes the nonrational element characteris-  
tic of vital religion: a psychic revelation of deity producing  
religious awe and ecstasy ~ usu. used with the (African Bush-  
men, awed by the presence of the ~ at a given place ... thrum-  
ing a few grains into a hole in the hallowed ground Joachim  
Wach) (the unanimity of prophets and seers regarding their  
experiences of the ~ -William Telfer)  
nu-mi-mat-ic 'n(ə)m(ə)j(ə)m(ə)ad(ə)k(ə), -m(ə)j(ə), -ad(ə) / adj also  
nu-mi-mat-ic 'n(ə)m(ə)j(ə)m(ə)ad(ə)k(ə), -m(ə)j(ə), -ad(ə) / adj [F numis-  
matique, fr. L numismat-, numisma, numismat-, numisma  
money, coin (fr. Gk numismat-, numisma custom, usage, cur-  
rency, coin) + F -ique: numismatical fr. L numismat-, fr. numis-  
ma] 1: of or relating to numismatics (will accept any  
time but would prefer it to be of some ~ value -J.M.Hage-  
man) 2: of or relating to currency: MONETARY (cowrie shells

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